

## 15.0 AOC 19 – CBR PROFICIENCY AREA

### 15.1 LOCATION OF STUDY AREA

The CBR Proficiency Area comprises approximately four acres within the Cantonment Area at the Fort McClellan, Alabama Army Installation (Fig. 1). The study area boundary was devised by adding a 50-ft buffer outside of the CBR Proficiency Area site boundary.

### 15.2 AERIAL PHOTOGRAPH QUALITY ISSUES

A few photograph quality issues were encountered during photograph interpretation. They were corrected as follows:

- X **Quality** - In many areas of the photographs, the dynamic range of brightness values was insufficient to distinguish land cover classes. Due to extreme brightness (almost white), ground cover such as grass, bare soil, trails, and roads could not be differentiated. Buildings could only be differentiated from paved area by stereo viewing. At other locations, extremely dark (nearly black) areas made it difficult to delineate grass, forested areas and shadows. Where appropriate, the problem areas of the photographs were subset and image enhancement techniques were applied. Simple adjustments to the brightness and contrast were conducted, or in more severe cases, a histogram equalization in the range of the lookup table was performed on the specific area where interpretation was difficult.
- X **Rectification** - Although second- and third-order transformations were used in the rectification of the digital photographs, in some photographs rectification within the CBR Proficiency Area contained too much error to accurately digitize land use/cover polygons. Factors contributing to the error included: (1) insufficient ground control points (GCPs) due to pronounced changes in land cover between years, (2) photographic distortion (location of the site in relation to the center of the photograph and the angle of the camera/aircraft when the photograph was acquired), and (3) terrain distortion (a single photograph may cover a large geographic area of varying elevations even though the site of interest may have little topographic relief). To improve the photographic registration of the study area, the CBR Proficiency Area was subset from the rectified digital photographs in question and the newly-created image files were rectified separately.

### 15.3 FINDINGS

Complete photographic coverage of the study area was available for eight years of photographic coverage from 1937 to 1994. A total of 172 anomalies were identified in the year-by-year land cover analysis (Fig. 2). All anomalies were inspected to ascertain the cause of each anomaly. All anomalies were resolved except for two unidentified structures. Anomalies potentially associated with waste disposal or chemical training activities were determined to be of potential concern and should be assessed by the USAESCH. During the final quality assurance review of the land use/cover anomalies, one anomaly was determined to be caused by a photographic interpretation error. This anomaly is identified as “QA” in Table 1 and will not be discussed further. Of the anomalies identified, 153 were caused by new roads, pre-existing and former roads and trails, construction and removal of buildings, sidewalks, landscaping, and paved areas. The remaining 18 anomalies are of

potential concern and were the result of trails, unidentified structures, and the clearing of trees and groundcover.

**1937.** Two anomalous areas were identified during the interpretation of the 1937 photographs (see Table 1 and Fig. 3a). One anomaly was the result of a pre-existing road. The remaining anomaly is of potential concern and was the result of a pre-existing trail (1 anomaly).

**1937 to 1940.** Five anomalies were identified during the land cover change analysis for the years 1937 and 1940 (see Table 1 and Fig. 3b). Two anomalies were the result of pre-existing roads and trails. The remaining three anomalies are of potential concern and were the result of new trails (2 anomalies) and another cleared area (1 anomaly).

**1940 to 1944.** Forty-seven anomalies were identified during the land cover analysis for the years 1940 and 1944 (see Table 1 and Fig. 3c). Forty-two of the anomalies were the result of new, pre-existing, and former roads; former trails; and the clearing of trees and other vegetation in association with road construction. The remaining five anomalies are of potential of concern and were the result of the clearing of vegetation (3 anomalies) and unidentified structures (2 anomalies).

**1944 to 1954.** Forty-three anomalies were identified during the land cover change analysis for the years 1944 and 1954 (see Table 1 and Fig. 3d). All forty-three anomalies were the result of pre-existing and former roads and cleared areas associated with the road shoulder. There are no anomalies of concern.

**1954 to 1961.** Twenty-three anomalies were identified during the land cover change analysis for the years 1954 and 1961 (see Table 1 and Fig. 3e). Twenty-one of the anomalies were the result of new roads, pre-existing and former roads and trails, and new and former cleared areas associated with the road shoulder. The remaining two anomalies are of potential concern and were the result of the clearing of trees (2 anomalies).

**1961 to 1969.** Nine anomalies were identified during the land cover change analysis for the years 1961 and 1969 (see Table 1 and Fig. 3f). Five of the anomalies were the result of pre-existing roads and former trails. The remaining four anomalies are of potential concern and were the result of the clearing of trees (2 anomalies) and other cleared areas (2 anomalies).

**1969 to 1982.** Six anomalies were identified during the land cover change analysis for the years 1969 and 1982 (see Table 1 and Fig. 3g). All six anomalies were the result of pre-existing roads, landscaping, paved areas, former cleared areas, and the clearing of trees associated with building construction. There are no anomalies of concern.

**1982 to 1994.** Thirty-six anomalies were identified during the land cover change analysis for the years 1982 and 1994 (see Table 1 and Fig. 3h). Thirty-three of the anomalies were the result of new and pre-existing roads, buildings, sidewalks, new and pre-existing paved areas, landscaping, and the clearing of trees associated with building construction and the road shoulder. The remaining three anomalies are of potential concern and were the result of the clearing of trees (2 anomalies) and another cleared area (1 anomaly).

Figure 1



Fig 2



**Table 1. CBR Proficiency Area - Anomaly Resolution**

<b>Of Potential Concern?</b>	<b>Anomaly #</b>	<b>Year of Change</b>	<b>Discussion</b>	<b>Related Anomalies<sup>1</sup></b>
Yes	1	1937	Trail	7, 31, 32, 35, 43, 45
	2	1937	Road	5, 12, 14 - 19, 21, 23, 24, 62, 88, 89, 92, 101, 103, 104
Yes	3	1940	Trail	8
Yes	4	1940	Cleared area	None
	5	1940	Pre-existing road (first visible 1937)	2, 12, 14 - 19, 21, 23, 24, 62, 88, 89, 92, 101, 103, 104
Yes	6	1940	Trail	26 - 28, 38, 40, 41, 46, 48, 51 - 53
	7	1940	Pre-existing trail (first visible 1937)	1, 31, 32, 35, 43, 45
	8	1944	Former trail (first visible 1937)	3
	9	1944	Road	55 - 59, 62 - 70, 78 - 82, 93 - 95, 114 - 116, 125, 126, 137
	10	1944	Road	83, 98, 122, ,131
	11	1944	Trees cleared (associated with road construction)	84, 99
	12	1944	Road (also part of former road - first visible 1937)	2, 5, 83, 98, 122, 131, 137
	13	1944	Road	83
	14	1944	Former road (first visible 1937)	2, 5
	15	1944	Road (also part of former road - first visible 1937)	2, 5, 81, 85, 99
	16	1944	Former road (first visible 1937)	2, 5
	17	1944	Pre-existing road (first visible 1937)	2, 5, 62, 88, 89, 92, 103, 104,
	18	1944	Former road (first visible 1937)	2, 5
	19	1944	Road (also part of former road - first visible 1937)	2, 5, 62, 101
	20	1944	Cleared area (associated with road construction)	90, 91, 100, 102, 120, 121
	21	1944	Former road (first visible 1937)	2, 5, 91
	22	1944	Cleared area (associated with road construction)	91, 102
	23	1944	Road	2, 5, 62, 101
	24	1944	Former road (first visible 1937)	1, 2, 5, 89
	25	1944	Road	62, 69, 101, 111, 112, 119

Of Potential Concern?	Anomaly #	Year of Change	Discussion	Related Anomalies <sup>1</sup>
	26	1944	Former trail (first visible 1940)	6
	27	1944	Road (also part of former trail - first visible 1940)	6, 62, 68, 69, 111, 112
	28	1944	Road (also part of former trail - first visible 1940)	6, 71
	29	1944	Road	71, 72
	30	1944	Road	73, 74
	31	1944	Former trail (first visible 1937)	1, 7
	32	1944	Road (also part of former trail - first visible 1937)	1, 72
	33	1944	Road	72
	34	1944	Building	35, 36, 76
	35	1944	Building	1, 7, 34, 36, 76
	36	1944	Building	34, 35, 76
	37	1944	Building	38, 39, 75
	38	1944	Building	6, 37, 39, 75
	39	1944	Building	37, 38, 75
	40	1944	Former trail (first visible 1940)	6
	41	1944	Road (also part of former trail - first visible 1940)	6, 62, 77, 116, 125
	42	1944	Road	62, 77, 116, 125, 127
	43	1944	Road (also part of former trail - first visible 1937)	1, 7, 62, 116, 129, 136
	44	1944	Road	62, 107 - 109, 116, 117, 129 136
	45	1944	Former trail (first visible 1937)	1, 7
	46	1944	Former trail (first visible 1940)	6
Yes	47	1944	Cleared area	61
Yes	48	1944	Cleared area (also part of former trail - first visible 1940)	6, 61
Yes	49	1944	Cleared area	61
	50	1944	Road	59
	51	1944	Road (also part of former trail - first visible 1940)	6, 59
	52	1944	Former trail (first visible 1940)	6
Yes	53	1944	Structure (unidentified) (also part of former trail - first visible 1940)	6, 54, 60



Of Potential Concern?	Anomaly #	Year of Change	Discussion	Related Anomalies <sup>1</sup>
Yes	54	1944	Structure (unidentified)	53, 60
	55	1954	Former road (first visible 1944)	9
	56	1954	Former road (first visible 1944)	9
	57	1954	Former road (first visible 1944)	9
	58	1954	Former road (first visible 1944)	9
	59	1954	Former road (first visible 1944)	9, 50, 51
	60	1954	Former structure (first visible 1944)	53, 54
	61	1954	Former cleared area (first visible 1944)	47, 48, 49
	62	1954	Trail (former road - partially overgrown - first visible 1944)	2, 5, 9, 17, 19, 23, 25, 27, 41 - 44, 101, 103, 104, 107, 108, 111, 112, 114 - 117, 119, 125 - 129, 136
	63	1954	Former road (overgrown - first visible 1944)	9, 115, 116
	64	1954	Former road (overgrown - first visible 1944)	9, 116
	65	1954	Former road (overgrown - first visible 1944)	9, 114, 115
	66	1954	Former road (overgrown - first visible 1944)	9
	67	1954	Former road (overgrown - first visible 1944)	9
	68	1954	Former road (overgrown - first visible 1944)	9, 27
	69	1954	Former road (overgrown - first visible 1944)	9, 25, 27
	70	1954	Former road (overgrown - first visible 1944)	9
	71	1954	Former road (overgrown - first visible 1944)	28, 29
	72	1954	Former road (overgrown - first visible 1944)	29, 32, 33
	73	1954	Former road (overgrown - first visible 1944)	30, 105, 122, 131
	74	1954	Former road (overgrown - first visible 1944)	30, 105, 122, 131
	75	1954	Former building (first visible 1944)	37, 38, 39
	76	1954	Former building (first visible 1944)	34 - 36
	77	1954	Former road (overgrown - first visible 1944)	41, 42
	78	1954	Former road (overgrown - first visible 1944)	9
	79	1954	Former road (overgrown - first visible 1944)	9

Of Potential Concern?	Anomaly #	Year of Change	Discussion	Related Anomalies <sup>1</sup>
	80	1954	Former road (overgrown - first visible 1944)	9
	81	1954	Former road (overgrown - first visible 1944)	9, 15
	82	1954	Cleared area (road shoulder)	9, 99
	83	1954	Pre-existing road (first visible 1944)	10, 12, 22, 98, 122, 131, 137
	84	1954	Cleared area (road shoulder)	11, 99
	85	1954	Cleared area (road shoulder)	15, 99
	86	1954	Cleared area (road shoulder)	99
	87	1954	Former road (first visible 1937)	13
	88	1954	Former road (first visible 1937)	2, 5, 17
	89	1954	Former road (first visible 1937)	2, 5, 17, 24
	90	1954	Cleared area (road shoulder)	20, 100, 120 - 122, 131
	91	1954	Former cleared area (first visible 1944)	20, 21, 22, 102
	92	1954	Former road (first visible 1937)	2, 5, 17
	93	1954	Former road (overgrown - first visible 1944)	9
	94	1954	Former road (overgrown - first visible 1944)	9
	95	1954	Former road (first visible 1944); cleared area (road shoulder) in 1954	9, 99
	96	1954	Former road (first visible 1944); cleared area (road shoulder) in 1954	13, 99
	97	1954	Former road (first visible 1937); cleared area (road shoulder) in 1954	13, 99
	98	1961	Pre-existing road (first visible 1944)	10, 12, 13, 83, 122, 131
	99	1961	Former cleared area (road shoulder - first visible 1954)	11, 15, 82, 84 - 86, 95 - 97
	100	1961	Former cleared area (road shoulder - first visible 1954)	20, 90
	101	1961	Former trail (also former road - first visible 1937)	2, 5, 19, 23 - 25, 62
	102	1961	Road	20, 22, 122, 131
	103	1961	Road (also part of former road - first visible 1937)	2, 5, 17, 62, 122, 131
	104	1961	Former road (first visible 1944)	2, 5, 17, 62
	105	1961	Road	73, 74, 122, 131
	106	1961	Road	122, 131

Of Potential Concern?	Anomaly #	Year of Change	Discussion	Related Anomalies <sup>1</sup>
	107	1961	Road	44, 62, 122, 129, 131
	108	1961	Former trail (also former road - first visible 1944)	44, 62, 129
	109	1961	Road	44, 122, 131
Yes	110	1961	Trees cleared	None
	111	1961	Former trail (also former road - first visible 1944)	25, 27, 62
	112	1961	Former trail (also former road - first visible 1944)	25, 27, 62
Yes	113	1961	Trees cleared	None
	114	1961	Former trail (also former road - first visible 1944)	9, 62, 65
	115	1961	Former trail (also former road - first visible 1944)	9, 62, 63, 65
	116	1961	Pre-existing trail (also former road - first visible 1944)	9, 41 - 44, 62 - 64, 125 - 129, 136
	117	1961	Former trail (also former road - first visible 1944)	44, 62, 129, 130, 136
	118	1961	QA	
	119	1961	Former trail (also former road - first visible 1944)	25, 62
	120	1961	Former cleared area (road shoulder - first visible 1954)	20, 90
	121	1961	Former cleared area (road shoulder - first visible 1954)	20, 90
	122	1969	Pre-existing road (first visible 1944)	10, 12, 13, 73, 74, 83, 90, 98, 102, 103, 105 - 107, 109, 131
Yes	123	1969	Trees cleared	None
Yes	124	1969	Trees cleared	None
	125	1969	Former trail (first visible 1944)	9, 41, 42, 62, 116
	126	1969	Former trail (first visible 1944)	9, 62, 116
	127	1969	Former trail (first visible 1944)	42, 62, 116
Yes	128	1969	Cleared area	62, 116, 136
	129	1969	Former trail (first visible 1944)	43, 44, 62, 107, 108, 116, 117, 136
Yes	130	1969	Cleared area	117, 136
	131	1982	Pre-existing road (first visible 1944)	10, 12, 13, 73, 74, 83, 90, 98, 102, 103, 105 - 107, 109, 122, 137
	132	1982	Trees cleared (associated with building construction)	132

Of Potential Concern?	Anomaly #	Year of Change	Discussion	Related Anomalies <sup>1</sup>
	133	1982	Landscaping	169
	134	1982	Paved area	164
	135	1982	Landscaping	171
	136	1982	Former cleared area (first visible 1969)	43, 62, 116, 117, 128 – 130
	137	1994	Pre-existing road (first visible 1944)	2, 5, 10, 12, 13, 83, 122, 131
	138	1994	Trees cleared (road shoulder)	None
Yes	139	1994	Trees cleared	None
	140	1994	Road	None
Yes	141	1994	Trees cleared	None
Yes	142	1994	Cleared area	None
	143	1994	Trees cleared (associated with building construction)	None
	144	1994	Building	None
	145	1994	Building	None
	146	1994	Building	None
	147	1994	Landscaping	132
	148	1994	Structure (sidewalk)	None
	149	1994	Landscaping	None
	150	1994	Structure (sidewalk)	None
	151	1994	Landscaping	None
	152	1994	Landscaping	None
	153	1994	Structure (sidewalk)	None
	154	1994	Paved area	None
	155	1994	Landscaping	None
	156	1994	Landscaping	None
	157	1994	Structure (sidewalk)	None
	158	1994	Landscaping	None
	159	1994	Landscaping	None
	160	1994	Structure (sidewalk)	None
	161	1994	Landscaping	None

Of Potential Concern?	Anomaly #	Year of Change	Discussion	Related Anomalies <sup>1</sup>
	162	1994	Paved area	None
	163	1994	Landscaping	None
	164	1994	Pre-existing paved area (first visible 1982)	134
	165	1994	Landscaping	None
	166	1994	Landscaping	None
	167	1994	Landscaping	None
	168	1994	Landscaping	None
	169	1994	Pre-existing landscaping (first visible 1982)	133
	170	1994	Landscaping	None
	171	1994	Paved area	None
	172	1994	Paved area	None

<sup>1</sup> Related anomalies refer to anomalies which are carried forward from year to year (e.g., a trail) or anomalies which change (e.g., the extension or widening of a trail or cleared area).

#### 15.4 ANOMALIES OF POTENTIAL CONCERN

One hundred seventy-one anomalies were identified during the photographic interpretation of the CBR Proficiency Area. All anomalies except for two unidentified structures have been resolved. Eighteen anomalies are considered to be of potential concern. To facilitate anomaly tracking, the anomalies of potential concern were mapped using the anomaly tracking number assigned in the year-by-year analysis (see Table 2 and Fig. 4). Table 2 provides information for each anomaly of potential concern, including the anomaly tracking number, coordinates for the approximate center of the anomaly (coordinates provided in Alabama State Plane East, North American Datum [NAD] 83), the year the change occurred, and the reason for the anomaly.

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Fig. 3a





Fig. 3b



Fig. 3c



Fig. 3d



Fig. 3e





Fig. 3f



Fig. 3g



Fig. 3h



**Table 2. CBR Proficiency Area - Anomalies of Concern**

Anomaly #	Alabama State Plane Coordinates (approximate anomaly center)		Year of Change	Discussion
	X-Coordinate	Y-Coordinate		
1	669024.16596	1167616.97710	1937	A pre-existing trail is evident in the 1937 photographs. The trail was present in 1940. By 1944, new roads and trails were developed throughout the area and this trail had become overgrown.
3	669046.45087	1168233.08948	1940	A new trail is evident in the 1940 photographs. By 1944, buildings had been constructed north of the trail (outside the study area) and the area which contained the trail was in use as landscaping.
4	669066.11403	1168104.62350	1940	This area was cleared between 1937 and 1940. By 1944, vegetation regrowth was underway and by 1961, the area had predominantly become reforested.
6	668942.89156	1167843.75889	1940	A new trail is evident in the 1940 photographs. By 1944, the trail was predominantly overgrown with vegetation, except in areas where new roads or trails were developed.
47	668929.78278	1167901.43750	1944	This area was cleared between 1940 and 1944. By 1954, vegetation regrowth was underway and by 1969, the area had become reforested.
48	668924.53927	1167884.39609	1944	This area was cleared between 1940 and 1944. By 1954, vegetation regrowth was underway and by 1969, the area had become reforested.
49	668900.94348	1167850.31328	1944	This area was cleared between 1940 and 1944. By 1954, vegetation regrowth was underway and by 1969, the area had become reforested.
53	668862.92803	1167999.75331	1944	A small structure of unidentified origin is visible in the 1944 photographs. The 1954 photographs show that the structure was no longer at the site (the structure may have been a transient object or was removed from the site).
54	668855.06277	1167984.02278	1944	A small structure of unidentified origin is visible in the 1944 photographs. The 1954 photographs show that the structure was no longer at the site (the structure may have been a transient object or was removed from the site).
110	669132.96878	1167624.84237	1961	Trees were cleared from this area between 1954 and 1961. By 1969, the area had become reforested.
113	669202.44528	1167822.78486	1961	Trees were cleared from this small between 1954 and 1961. By 1969, vegetation regrowth was underway and by 1982, the area had become reforested.
123	669117.23825	1167913.23540	1969	Trees were cleared from this small area between 1961 and 1969. By 1982, the area had become reforested.
124	669190.64739	1167869.97644	1969	Trees were cleared from this small area between 1961 and 1969. By 1982, the area had become reforested.
128	669037.27473	1167619.59886	1969	Trees were cleared from this small area between 1961 and 1969. By 1982, the area had become reforested.
130	669003.19192	1167602.55745	1969	Trees were cleared from this small area between 1961 and 1969. By 1982, the area had become reforested.

Anomaly #	Alabama State Plane Coordinates (approximate anomaly center)		Year of Change	Discussion
	X-Coordinate	Y-Coordinate		
139	669131.65790	1168248.82001	1994	Trees were cleared in this area between 1982 and 1994.
141	668869.48242	1168095.44736	1994	Trees were cleared from this small area between 1961 and 1969. By 1982, the area had become reforested.
142	668886.52383	1168067.91893	1994	Trees were cleared from this small area between 1961 and 1969. By 1982, the area had become reforested.



**Figure 4**